Space Weather Forecast

Issued on Wednesday 9 October 2024 at 01:21 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Strong flares. Chance of Minor Solar Radiation Storm. Chance of Minor/Moderate Geomagnetic Storms.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Started the previous 24 hours at Moderate levels, due to the declining trend from the second Strong flare on the 7th. Low level Moderate class flares followed through the day from various regions on the visible disc. There are currently five numbered regions on the disc, with the addition of a very small and simple region which has recently emerged in the northeast quadrant. Of the numbered regions on the disc one is magnetically complex, and three others are moderately magnetically complex.

A large filament eruption was seen to have left the Sun early on 08 Oct, it appears to be directed mainly south, but a weak glancing blow from the associated Coronal Mass Ejection (CME) is possible on the 11th.

Solar Wind / Geomagnetic Activity: The period started with residual CME influence, possibly from the glancing influence of the 04 Oct CME. The onset of a weak coronal hole high speed stream also potentially occurred. Solar wind speed remained slightly elevated, mainly between 400-470km/s, with density varying between below average and average values. The strength the solar wind's magnetic field, was initially Strong but then declined to Moderate levels. The north-south component favoured a negative orientation with only brief spells of positive (northward), and was initially Strongly negative, then declined to end the period weakly negative. Geomagnetic activity started at Strong geomagnetic storm levels between 08/0000-0600 UTC. Activity then decreased to end the day at Quiet levels.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was initially slightly raised but then decreased to background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate activity is expected, with a chance of isolated Strong flares until day 2 (10 Oct). From day 3 (11 Oct) activity is then expected to decrease Low to Moderate, but with a slight chance of Strong flares. However, new or returning regions are likely to rotate onto the visible disc through the period, therefore potentially increasing activity again.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 370 900 0100 Email: enquiries@metoffice.gov.uk

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Solar Wind / Geomagnetic Activity: No Earth-directed CMEs currently feature in the forecast. However, there are potential glancing CMEs. The solar wind environment around Earth starts slightly disturbed, due to residual CME influences and possibly a weak high speed stream from CH78/+. Solar wind speeds are expected to remain slightly elevated, with a slight chance of becoming temporarily enhanced during days 2 or 3 should any glancing CME impacts occur. Later in the period winds are expected to decrease to background levels.

Geomagnetic activity is expected to be Active to Minor Storm initially. Activity will then decline, becoming predominantly Quiet to Unsettled for the rest of the period, but with a chance of Minor Storms during days 2 and 3 (10th and 11th). However, any CME glancing impacts will bring a chance of Minor to Moderate storms.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) responded erratically to the two strong flares from late on 07 Oct. There is a chance of reaching S1 proton levels today and tomorrow, then decreasing to a slight chance by the end of the period.

Geomagnetic Storms

Geomagnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	Yes	70	30	20	20
Strong	G3	Yes	20	5	2	2
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 (M Class)	Yes	80	80	70	50
Very Active	R3-R5 (X Class)	No	30	30	20	10

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	40	20	10	10
Very Active	**≥ S3 ***	No	1	1	1	5
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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